

**In the Claims:**

Claims 1 – 13 (Cancel)

14. (NEW) In a receiver, a method for demodulating an M-ary modulated information signal received on at least one receive antenna, said method comprising the steps of:

estimating at least one channel coefficient associated with the M-ary modulated information signal to produce at least one channel estimate;

pre-computing multiplication product values for a set of transmitted symbol values and a complex number, wherein the complex number depends on said at least one channel estimate;

storing the pre-computed multiplication product values in a product look-up table; and

determining branch metrics in a nonlinear maximum-likelihood sequence-estimation equalizer through repeated use of the pre-computed multiplication product values to demodulate the received information signal yielding transmitted information.

15. (NEW) The method of claim 14 wherein the set of transmitted symbol values comprises all M possible symbol values.

16. (NEW) The method of claim 14 wherein the set of transmitted symbol values comprises a subset of the M possible symbol values.

17. (NEW) The method of claim 14 wherein the complex number comprises the channel estimate.

18. (NEW) The method of claim 14 wherein the complex number comprises s-parameters in an Ungerboeck branch metric.

19. (NEW) The method of claim 14 wherein the complex number comprises metric multipliers in a partial Ungerboeck branch metric.

20. (NEW) In a receiver, a nonlinear maximum-likelihood sequence-estimation equalizer for demodulating an M-ary modulated information signal received on at least one receive antenna, the nonlinear maximum-likelihood sequence-estimation equalizer comprising:

a channel coefficient estimator for producing least one channel estimate associated with the M-ary modulated information signal;

a memory for storing a product look-up table having pre-computed multiplication product values equal to the product of a set of transmitted symbol values and a complex number, wherein the complex number depends on the at least one channel estimate; and

a branch metric computer for determining branch metrics through repeated use of the pre-computed multiplication product values to demodulate the received information signal yielding transmitted information.

21. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 20 wherein the set of transmitted symbol values comprises all M possible symbol values.

22. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 20 wherein the set of transmitted symbol values comprises a subset of the M possible symbol values.

23. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 20 wherein the complex number comprises the channel estimate.

24. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 20 wherein the complex number comprises s-parameters in an Ungerboeck branch metric.

25. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 20 wherein the complex number comprises metric multipliers in a partial Ungerboeck branch metric.

26. (NEW) In a receiver, a nonlinear maximum-likelihood sequence-estimation equalizer for demodulating an M-ary modulated information signal received on at least one receive antenna, the nonlinear maximum-likelihood sequence-estimation equalizer comprising:

means for producing least one channel estimate associated with the M-ary modulated information signal;

means for storing a product look-up table having pre-computed multiplication product values equal to the product of a set of transmitted symbol values and a complex number, wherein the complex number depends on the at least one channel estimate; and

means for determining branch metrics through repeated use of the pre-computed multiplication product values to demodulate the received information signal yielding transmitted information.

27. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 26 wherein the set of transmitted symbol values comprises all M possible symbol values.

28. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 26 wherein the set of transmitted symbol values comprises a subset of the M possible symbol values.

29. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 26 wherein the complex number comprises the channel estimate.

30. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 26 wherein the complex number comprises s-parameters in an Ungerboeck branch metric.

31. (NEW) The nonlinear maximum-likelihood sequence-estimation equalizer of claim 26 wherein the complex number comprises metric multipliers in a partial Ungerboeck branch metric.